

Getting Hooked: Working with Recreational Anglers to Collect Baseline Data in Marine Protected Areas

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Project Overview

- In 2007 and 2008, we conducted baseline surveys of 4 new Marine Protected Areas (MPAs) along the central CA coast (**Figure 1**)
- We worked with volunteer recreational anglers and Commercial Passenger Fishing Vessel (CPFV) captains to catch, tag, and release fishes using standardized monitoring protocols
- This project is a collaboration of resource managers, academic scientists, NGOs, and California fishing communities
- Over the course of the project, we worked with 10 CPFV vessels and nearly 400 recreational anglers, completed 82 survey days, and caught nearly 18,000 fishes
- Results are presented for the Point Lobos study area
- The 2007 and 2008 survey data can be used to create a baseline to evaluate inter-annual variability and MPA effects on fish populations over time (**Figure 2**)



Figure 1. The MPAs (State Marine Reserves, SMRs, and State Marine Conservation Areas, SMCAs) that were surveyed for this project.

Survey Protocols

- Each MPA and reference pair was sampled 4 days per month for 3 months
- 500m x 500m grid cells were created in each MPA and corresponding reference site based on:
 - Fishermen knowledge
 - Bathymetry (less than 40m)
 - Substrate data (presence of rocky habitat)
- Each survey day, 4 grid cells were chosen at random and sampled aboard CPFVs using hook-and-line fishing techniques (**Photo 1**)
- Volunteer anglers caught all fishes with standardized fishing tackle (**Photo 2**)
- Anglers fished 30- 45 min per grid cell
- Captured fish were measured, tagged, and released (**Photos 3-5**)
- Fishes exhibiting barotrauma were vented using a hypodermic needle and/or were released using a fish descending device (**Photo 6**)

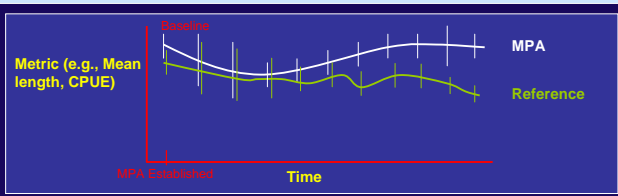


Figure 2. A theoretical model for evaluating trends in fish populations within an MPA relative to a reference site to assess MPA effects. The 2007 and 2008 survey data will serve as a baseline for monitoring.

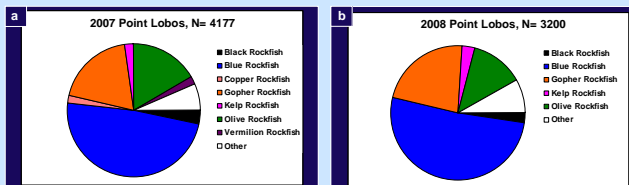


Figure 3. Species composition of fishes caught in the Point Lobos study area in 2007 (a) and 2008 (b).

Results and Conclusions

- Species compositions of fishes caught in 2007 and 2008 were similar (**Figure 3**)
- Mean total lengths of the most abundant fishes did not significantly change from 2007 to 2008 except for blue and olive rockfishes (**Figure 4**)
- In 2008, mean total lengths of blue and olive rockfishes significantly increased in the MPA, but did not significantly change in the reference site
- Catch rates for the most abundant fishes either remained the same or declined in both the MPA and reference sites (**Table 1**)
- Overall catch rates (all species combined) declined in both the MPA and reference sites
- Change (or lack of change) in species composition, mean length, or CPUE from 2007 to 2008 cannot be attributed to a MPA effect, a change in fish abundance, or natural temporal variation
- A 3rd year of data is needed to create a baseline in order to differentiate between inter-annual variability and MPA effects

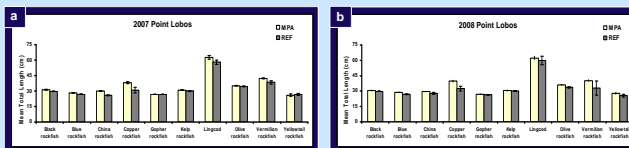


Figure 4. Mean total lengths (cm) of abundant fishes caught in 2007 (a) and 2008 (b) in the Point Lobos MPA and reference (REF) sites.

Change in Point Lobos CPUEs from 2007 to 2008		
	Δ MPA	Δ REF
Black rockfish	-0.1	-0.8
Blue rockfish	-1.7	-2.0
China rockfish	-0.1	-0.1
Copper rockfish	-0.2	0.0
Gopher rockfish	-0.7	-1.0
Kelp rockfish	-0.1	-0.1
Lingcod	0.0	0.0
Olive rockfish	-1.7	-0.6
Vermilion rockfish	-0.2	-0.1
Yellowtail rockfish	0.0	-0.1
Average	-0.5	-0.5

Table 1. Change in Point Lobos MPA and reference (REF) site 2008 and 2007 (2008-2007) catch per angler hour values (CPUE) for abundant fishes

For more information about this study, visit:
<http://seagrant.mml.calstate.edu/research/ccfcp/> and
<http://www.slosea.org/collaborative/>

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